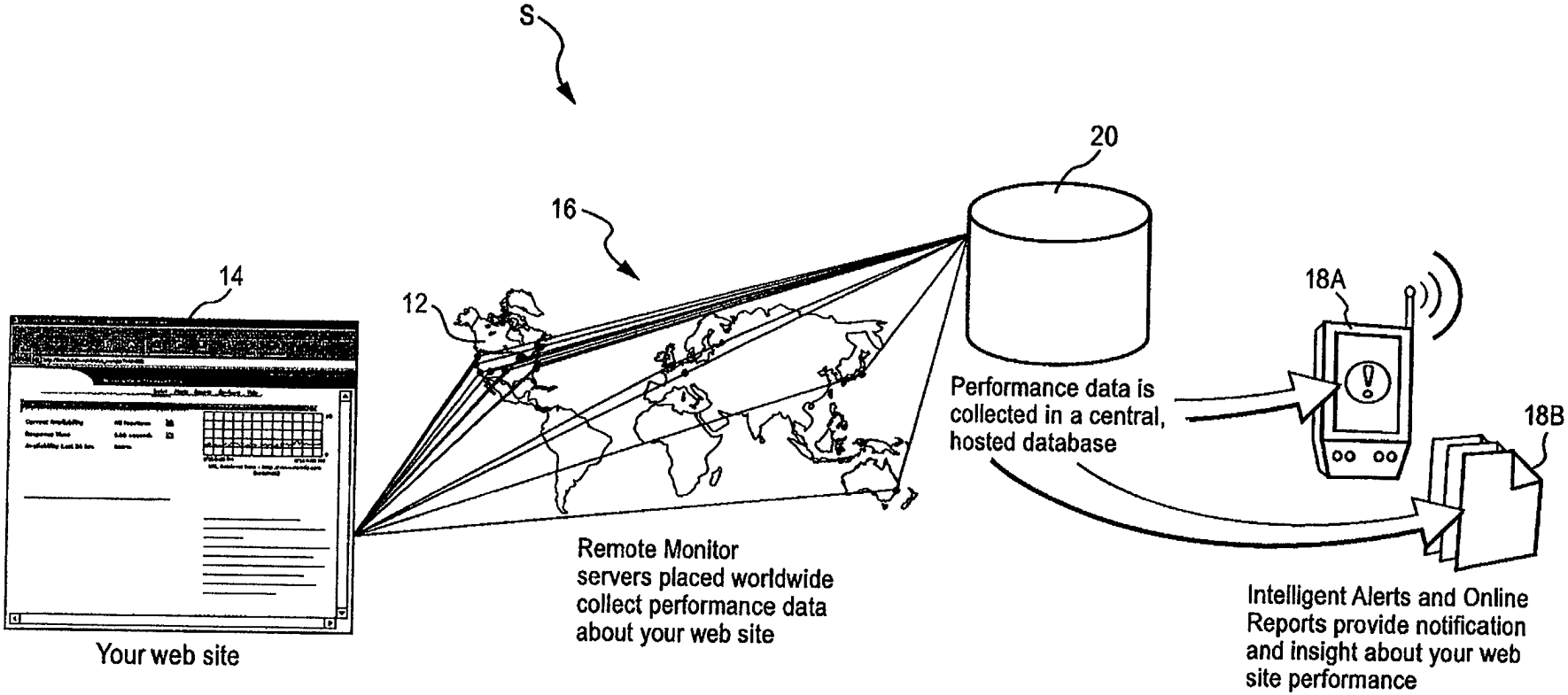
S
20
16
14
12
18A
Performance data is collected in a central, hosted database
18B
Your web site
Remote Monitor servers placed worldwide collect performance data about your web site
Intelligent Alerts and Online Reports provide notification and insight about your web site performance

Fig. 1

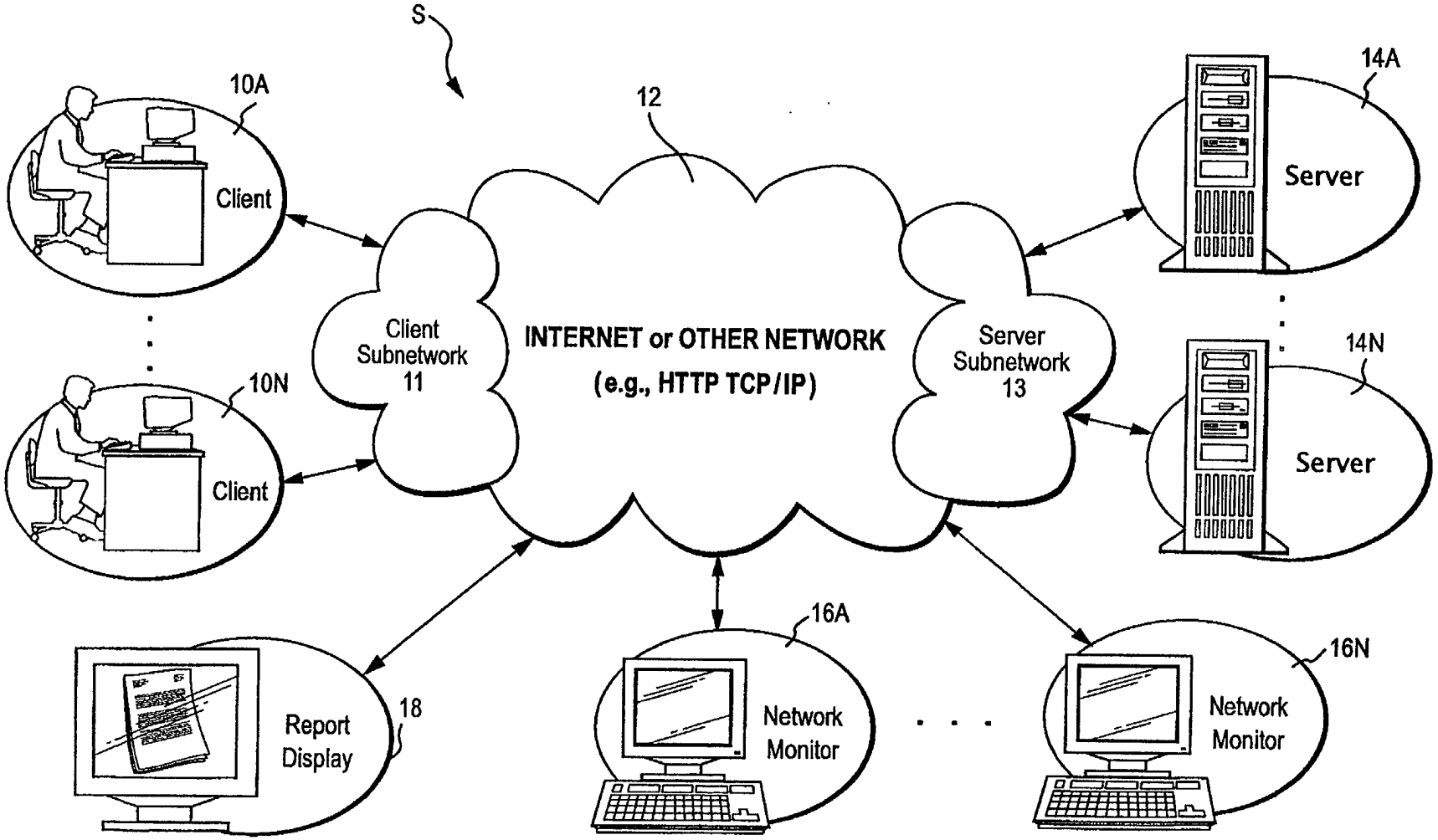
S
10A
Client
10N
Client
12
Client Subnetwork 11
INTERNET or OTHER NETWORK
(e.g., HTTP TCP/IP)
Server Subnetwork 13
14A
Server
14N
Server
16A
Network Monitor
16N
Network Monitor
18
Report Display

Fig. 2

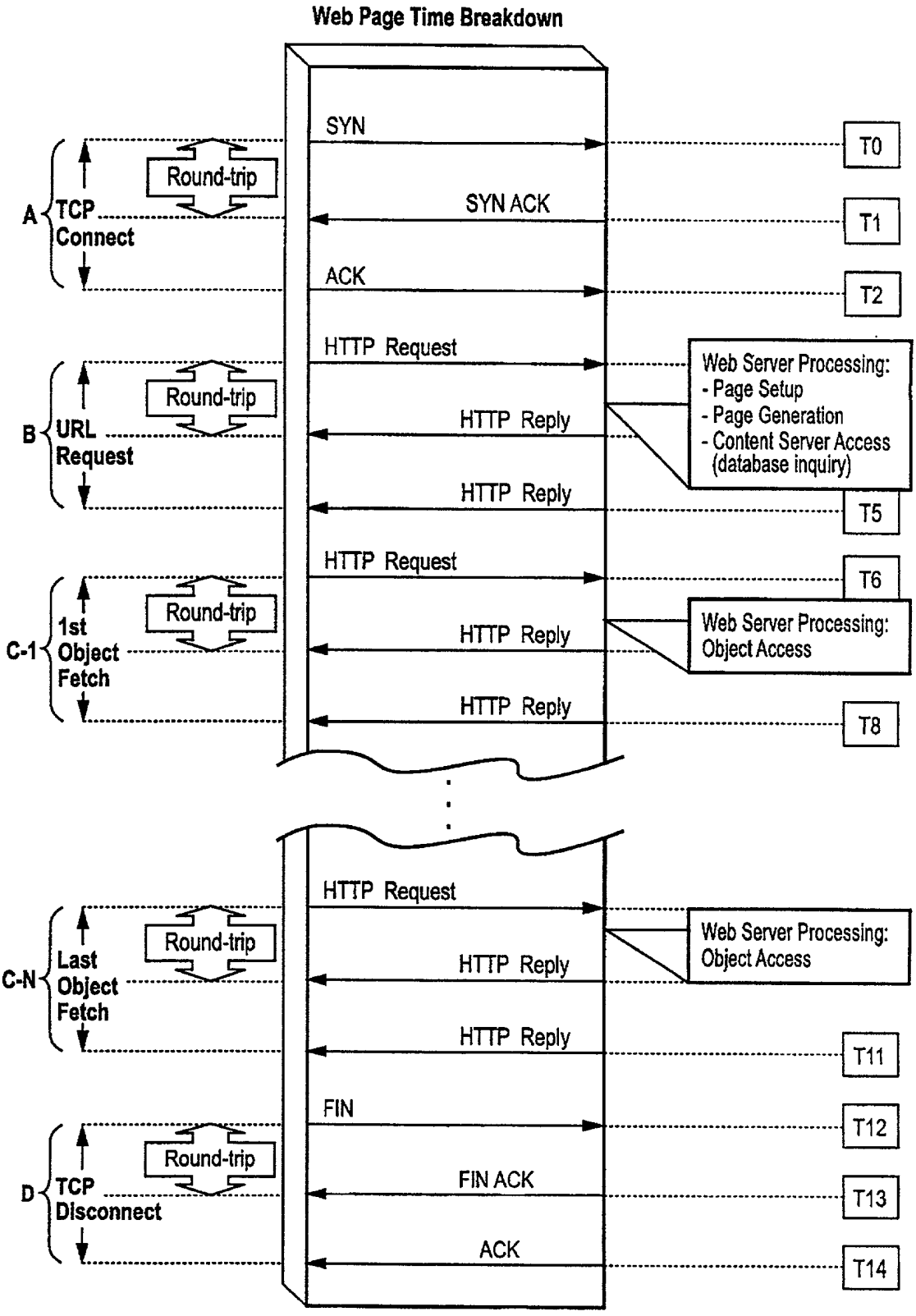
Web Page Time Breakdown
SYN
SYN ACK
ACK
HTTP Request
HTTP Reply
HTTP Reply
HTTP Request
HTTP Reply
HTTP Reply
HTTP Request
HTTP Reply
HTTP Reply
FIN
FIN ACK
ACK
T0
T1
T2
T5
T6
T8
T11
T12
T13
T14
A
TCP Connect
B
URL Request
C-1
1st Object Fetch
C-N
Last Object Fetch
D
TCP Disconnect
Round-trip
Web Server Processing:
- Page Setup
- Page Generation
- Content Server Access (database inquiry)
Web Server Processing: Object Access
Web Server Processing: Object Access

Fig. 3

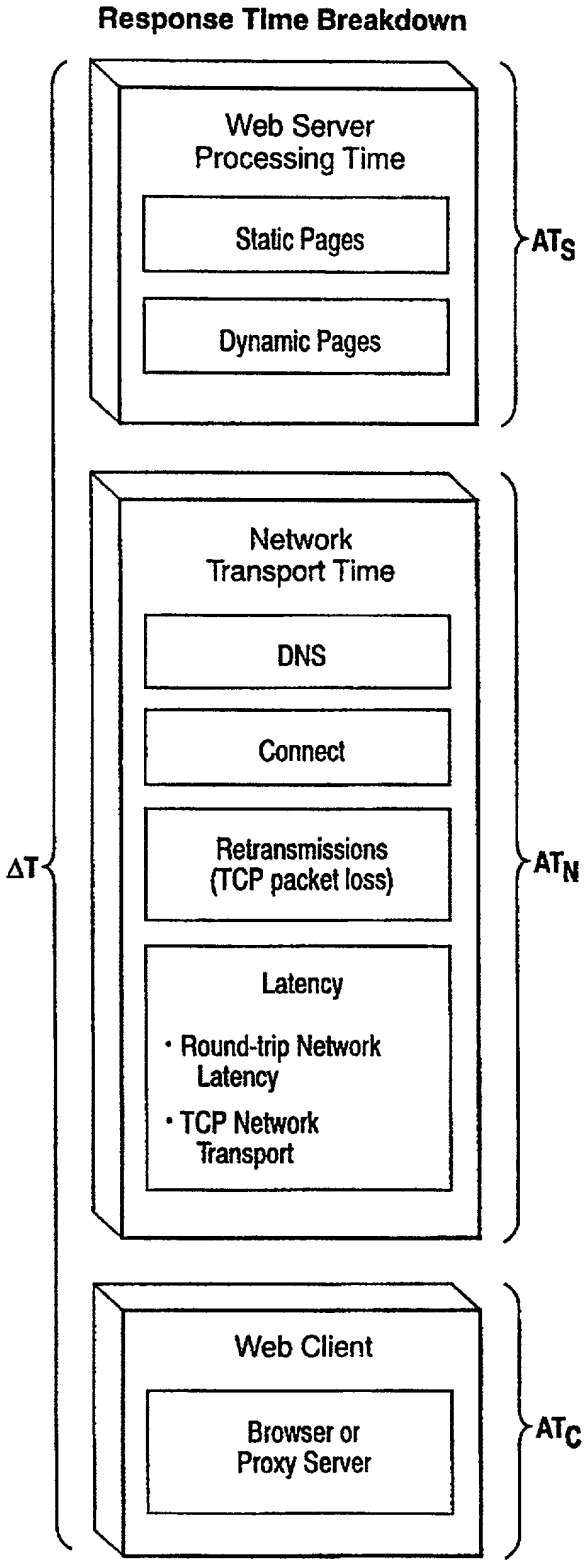
Response Time Breakdown
Web Server
Processing Time
Static Pages
Dynamic Pages
ATS
Network
Transport Time
DNS
Connect
Retransmissions
(TCP packet loss)
Latency
• Round-trip Network
Latency
• TCP Network
Transport
ATN
ΔT
Web Client
Browser or
Proxy Server
ATC

Fig. 4

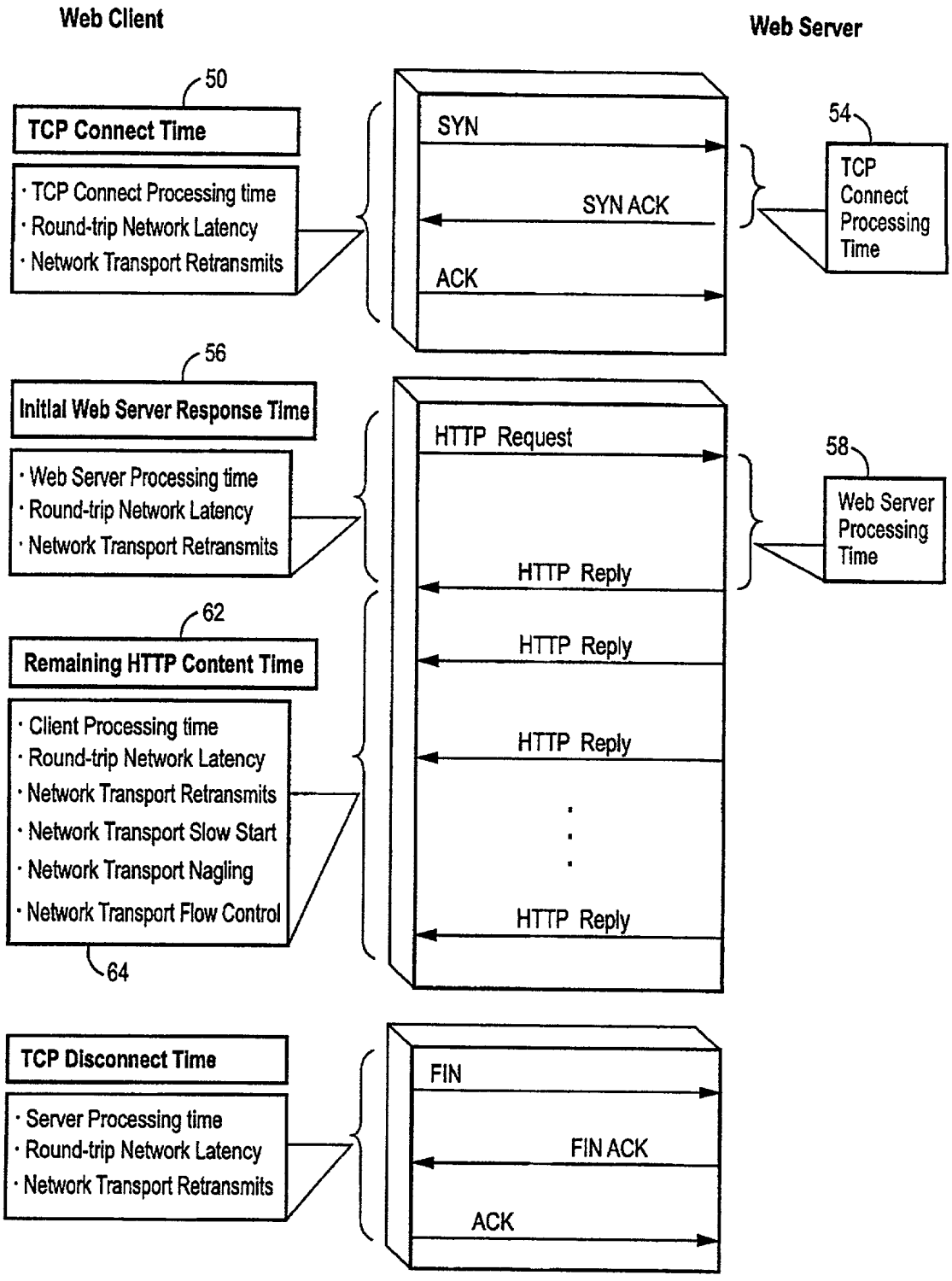
Web Client
Web Server
50
TCP Connect Time
· TCP Connect Processing time
· Round-trip Network Latency
· Network Transport Retransmits
SYN
SYN ACK
ACK
54
TCP Connect Processing Time
56
Initial Web Server Response Time
· Web Server Processing time
· Round-trip Network Latency
· Network Transport Retransmits
HTTP Request
HTTP Reply
58
Web Server Processing Time
62
Remaining HTTP Content Time
· Client Processing time
· Round-trip Network Latency
· Network Transport Retransmits
· Network Transport Slow Start
· Network Transport Nagling
· Network Transport Flow Control
64
HTTP Reply
HTTP Reply
HTTP Reply
HTTP Reply
TCP Disconnect Time
· Server Processing time
· Round-trip Network Latency
· Network Transport Retransmits
FIN
FIN ACK
ACK

Fig. 5

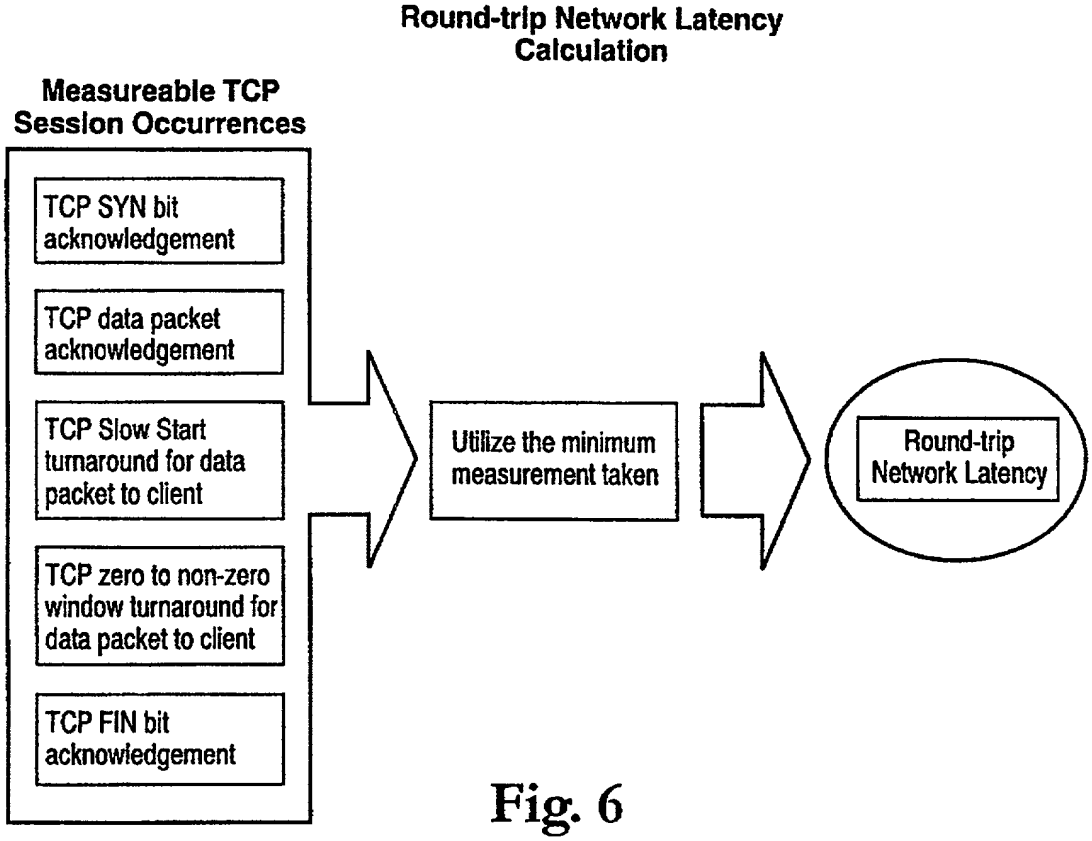

Fig. 6

Example Connect Time Metric 'Bucket' Breakdown

0ms - 500ms	500ms - 1 second	1 second - 3 seconds	4 seconds or higher
7840	529	9	1

Fig. 8

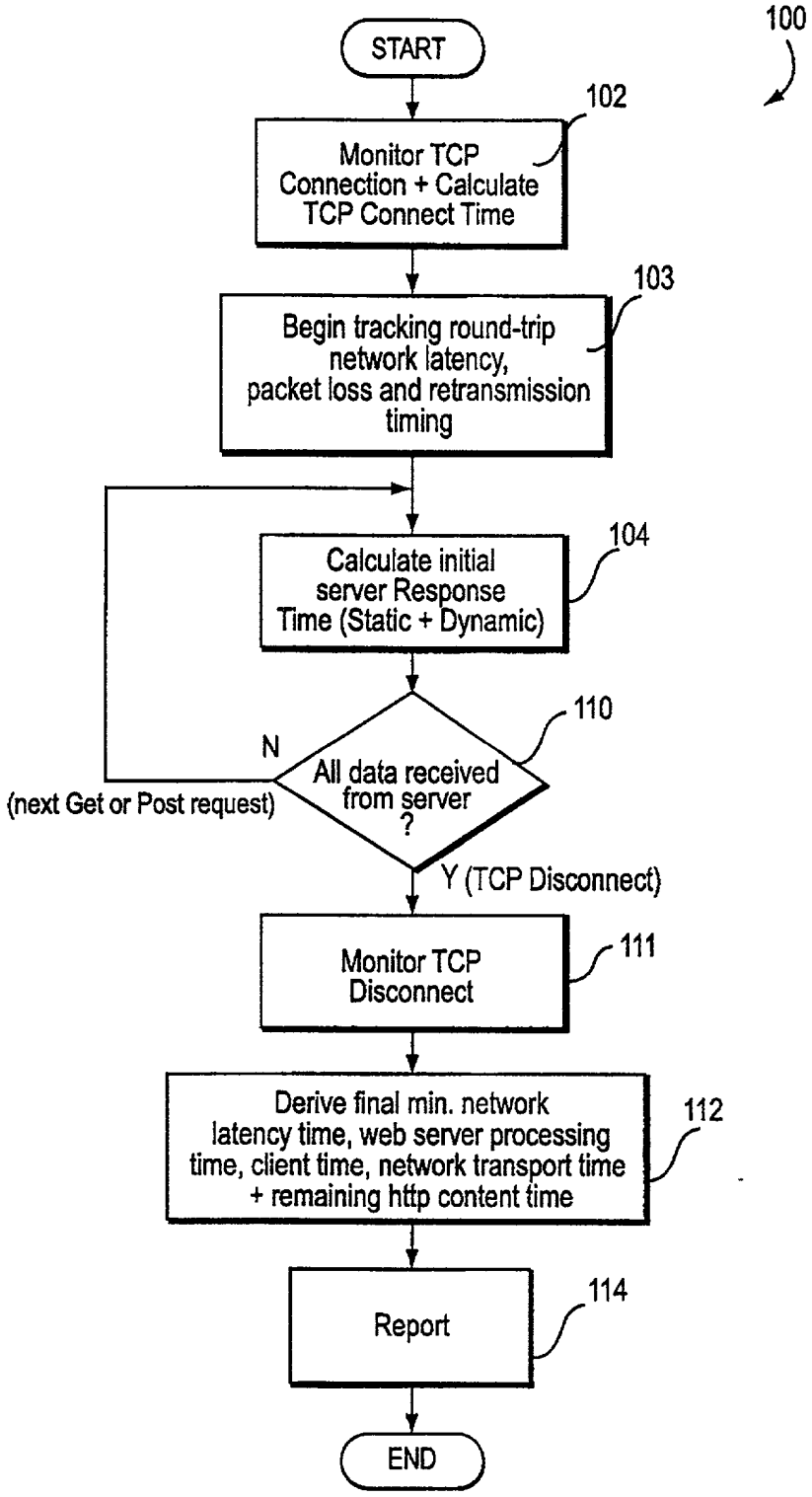
100
START
102
Monitor TCP Connection + Calculate TCP Connect Time
103
Begin tracking round-trip network latency, packet loss and retransmission timing
104
Calculate initial server Response Time (Static + Dynamic)
110
All data received from server ?
N
(next Get or Post request)
Y (TCP Disconnect)
111
Monitor TCP Disconnect
112
Derive final min. network latency time, web server processing time, client time, network transport time + remaining http content time
114
Report
END

Fig. 7

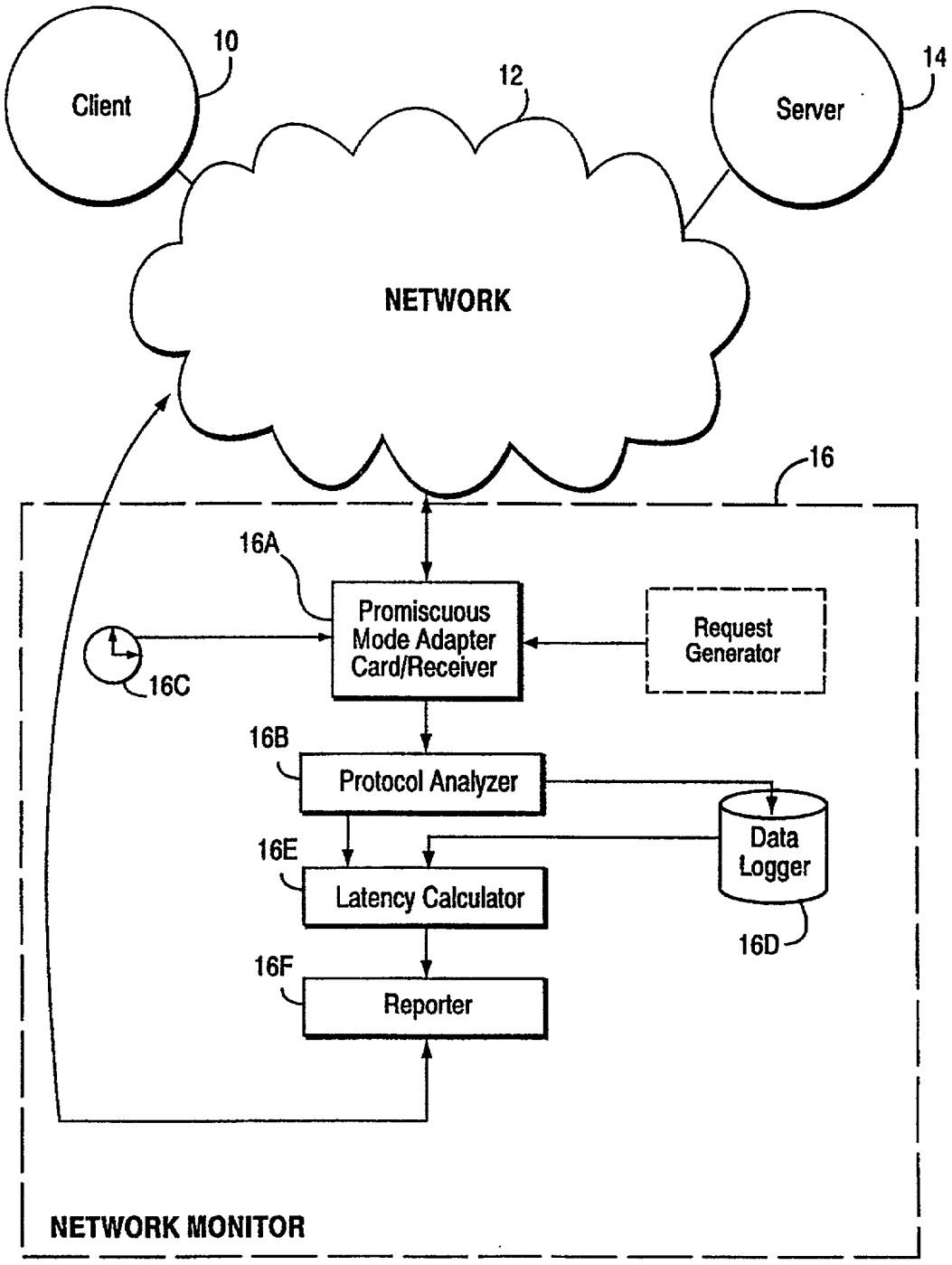

Fig. 9 Example Network Monitor Architecture

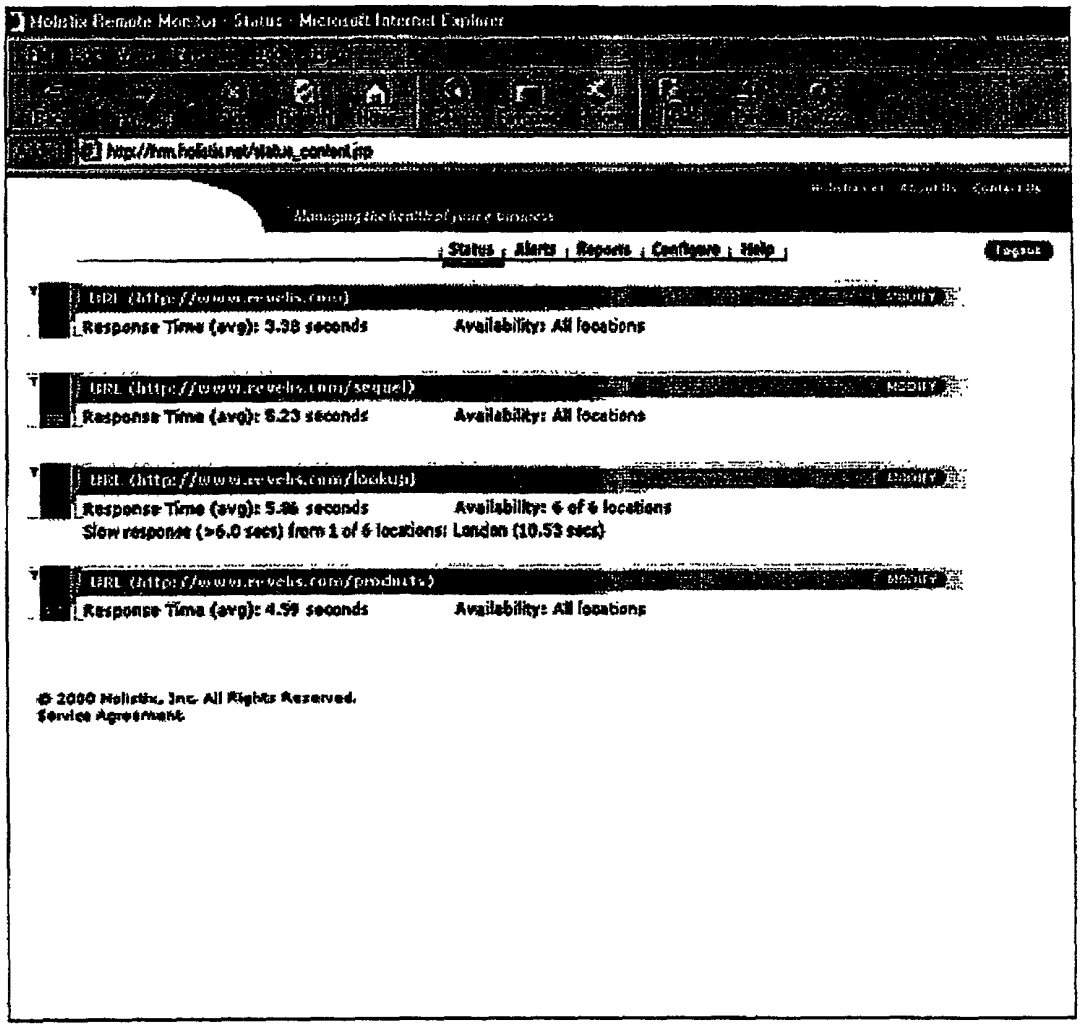
Status | Alerts | Reports | Configure | Help
Response Time (avg): 3.38 seconds
Availability: All locations
Response Time (avg): 8.23 seconds
Availability: All locations
Response Time (avg): 5.86 seconds
Availability: 6 of 6 locations
Slow response (>6.0 secs) from 1 of 6 locations: London (10.53 secs)
Response Time (avg): 4.59 seconds
Availability: All locations
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Fig. 10A

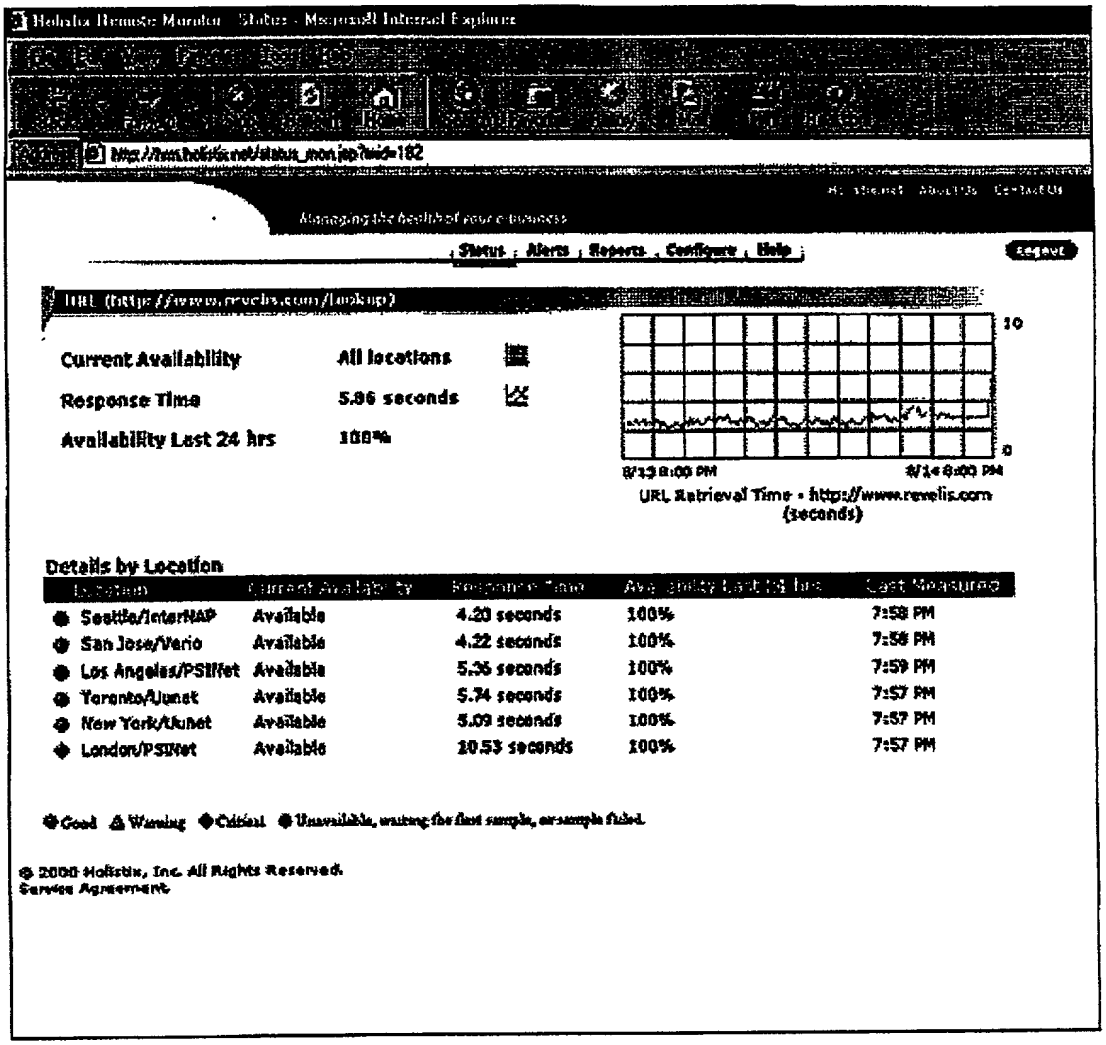
Current Availability
All locations
Response Time
5.86 seconds
Availability Last 24 hrs
100%
10
0
8/13 8:00 PM
8/14 8:00 PM
URL Retrieval Time - http://www.revelis.com
(seconds)
Details by Location
Seattle/InterNAP Available 4.20 seconds 100% 7:58 PM
San Jose/Verio Available 4.22 seconds 100% 7:58 PM
Los Angeles/PSINet Available 5.36 seconds 100% 7:59 PM
Toronto/Uunet Available 5.74 seconds 100% 7:57 PM
New York/Uunet Available 5.09 seconds 100% 7:57 PM
London/PSINet Available 10.53 seconds 100% 7:57 PM
Good
Warning
Critical
Unavailable, waiting for first sample, or sample failed.
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Fig. 10B

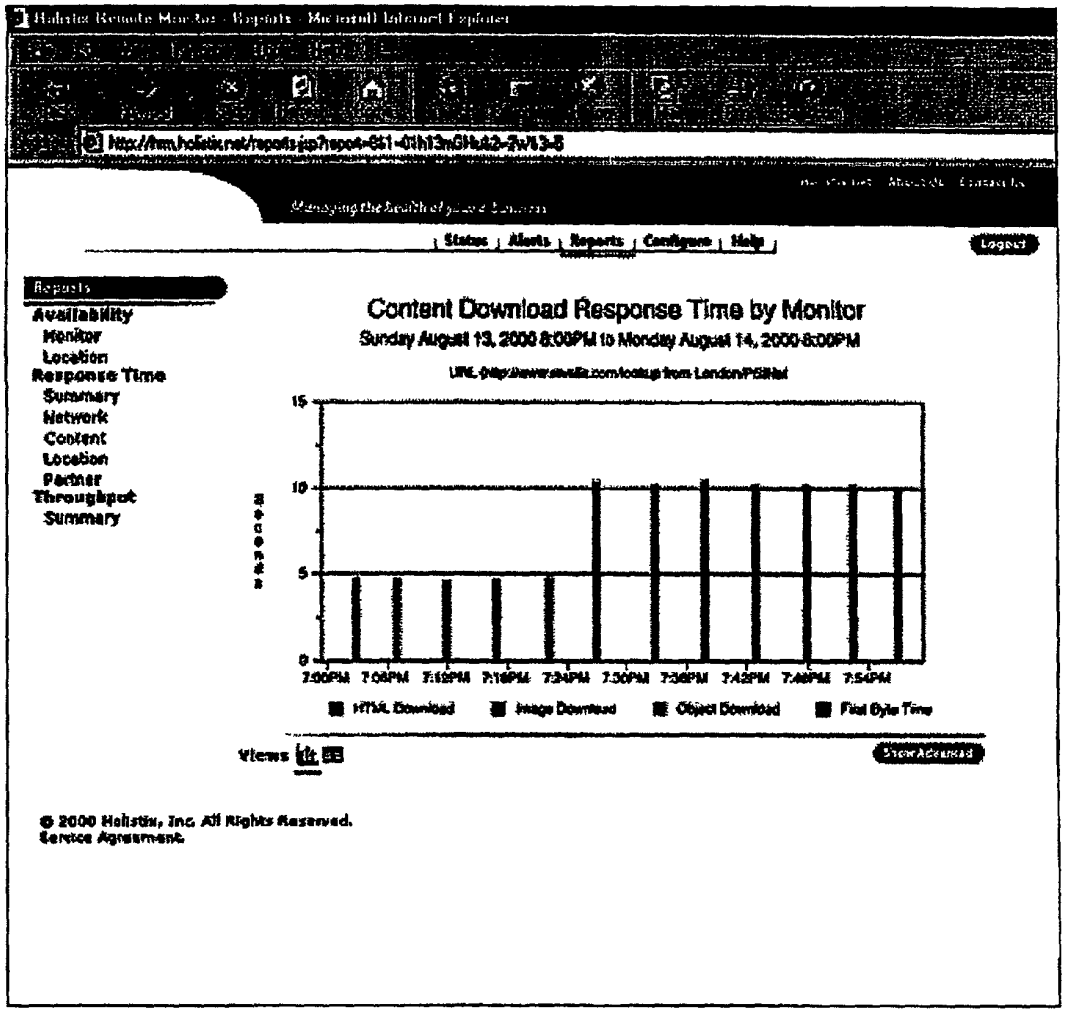
Status
Alerts
Reports
Configure
Help
Logout
Reports
Availability
Monitor
Location
Response Time
Summary
Network
Content
Location
Partner
Throughput
Summary
Content Download Response Time by Monitor
Sunday August 13, 2000 8:00PM to Monday August 14, 2000 8:00PM
15
10
5
0
7:00PM
7:08PM
7:16PM
7:24PM
7:30PM
7:36PM
7:42PM
7:48PM
7:54PM
HTML Download
Image Download
Object Download
First Byte Time
Views
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Fig. 10C